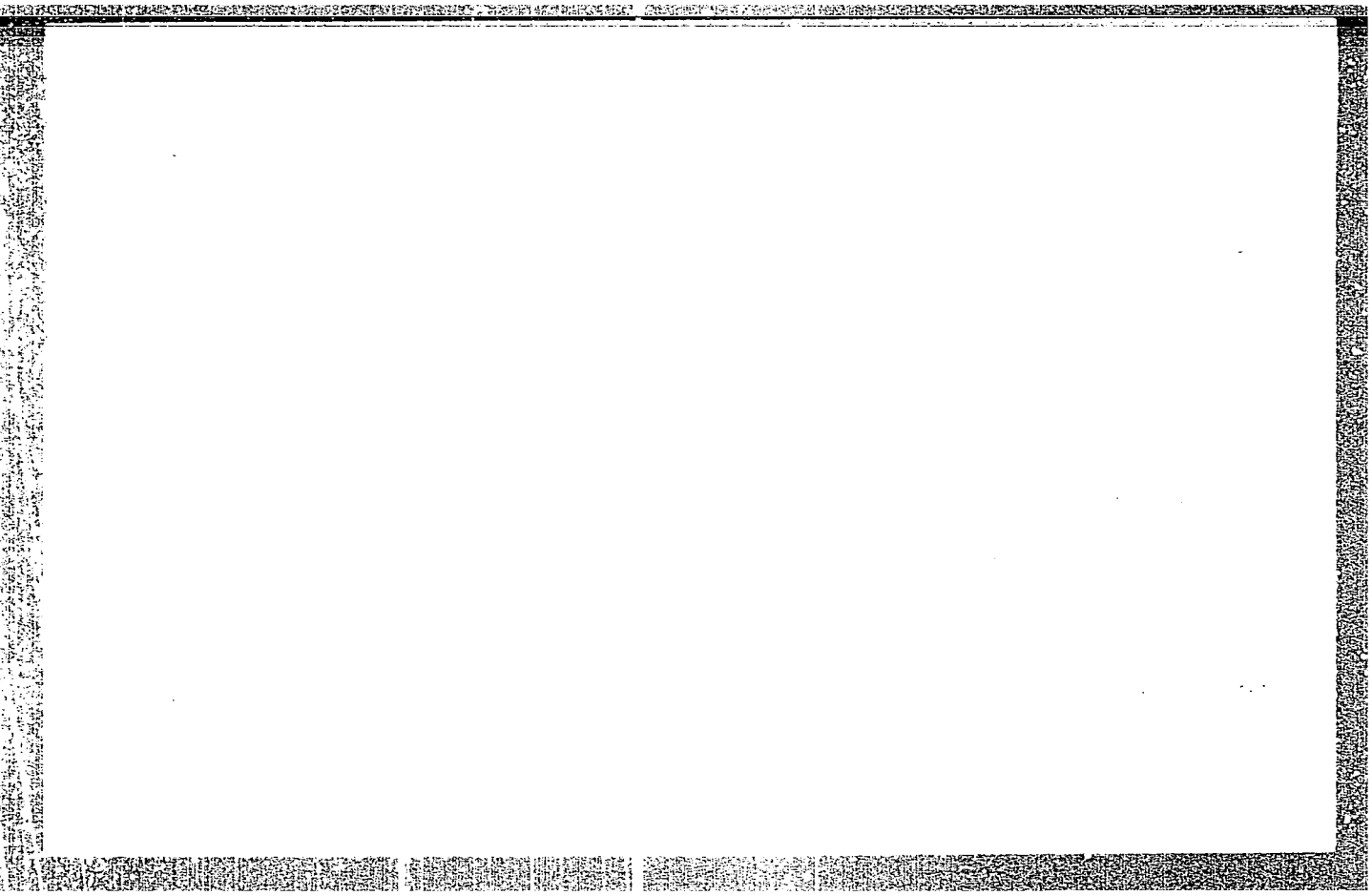
FIOSHIN, M.Ya.; TOMILOV, A.P.

Electrochemical dimerization as a promising method for the synthesis of organic compounds. Khim. prom. 40 no.9:649-657 S '64.
(MIRA 17:11)



APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R001756220006-2"

TOMILOV, A.P.; MAKAROCHKINA, S.M.

Polarographic determination of cyanogen chloride in aqueous solutions. Zhur. anal. khim. 19 no.5:646-648 '64.
(MIRA 17:8)

FIOSHIN, M.Ya.; TOMILOV, A.P.; AVRUTSKAYA, I.A.; KAZAKOVA, L.I.; YESKIN, N.T.; GROMOVA, G.A.

Means of synthesizing diols. Zhur. VKHO 8 no.5:600 '63. (MIRA 17:1)

1. Moskovskiy khimiko-tekhnologicheskiy institut imeni D.I. Mendeleyeva.

FEOKTISTOV, L.G.; TOMILOV, A.P.; GOL'DIN, M.M.

Conjugated electrochemical cleavage of halogen compounds. Izv. AN SSSR. Ser.khim. no.7:1352 Jl '63. (MIRA 16:9)

1. Institut elektrokhimii AN SSSR.
(Halogen compounds) (Reduction, Electrolytic)

TOMILOV, A.P.

Laboratory electrolyzer for the electrolysis of organic substances in heterogeneous media. Zhur.prikl.khim. 36 no.6:1362-1365 Je '63. (MIRA 16:8)
(Organic compounds) (Electrolysis)

TOMILOV, A.P.; FIOSHIN, M.Ya.

Reaction of free radicals during electrolysis of organic compounds. Usp.khim. 32 no.1:60-92 Ja '63. (MIRA 16:2)

1. Institut elektrokhimii AN SSSR.
(Radicals (Chemistry))
(Organic compounds) (Electrolysis)

KHOMYAKOV, V.G.; TOMILOV, A.P.

Effect of electrolysis conditions on the reduction of acetone on a zinc cathode. Zhur.prikl.khim. 36 no.2:378-385 F '63. (MIRA 16:3)
(Acetone) (Reduction, Electrolytic) (Electrodes, Zinc)

KHOMYAKOV, V.G.; TOMILOV, A.P.

Effect of the structure of a zinc cathode on the electrolytic reduction of acetone. Zhur.prikl.khim. 36 no.2:373-378 F '63. (MIRA 16:3)
(Electrodes, Zinc) (Acetone) (Reduction, Electrolytic)

TOMILOV, A.P.; KAABAK, L.V.

Cathodic hydrodimerization of esters of α,β-unsaturated acids. Zhur.ob.khim. 33 no.3:731-734 Mr '63. (MIRA 16:3)
(Unsaturated compounds)
(Esters) (Polymerization)

TOMILOV, A.P.; SEVAST'YANOVA, I.G.; DUBOV, S.S.

Nature of conjugation in esters of azodicarboxylic acid.
Zhur.ob.khim. 33 no.3:866-867 Mr '63. (MIRA 16:3)
(Formic acid)
(Esters)
(Conjugation (Chemistry))

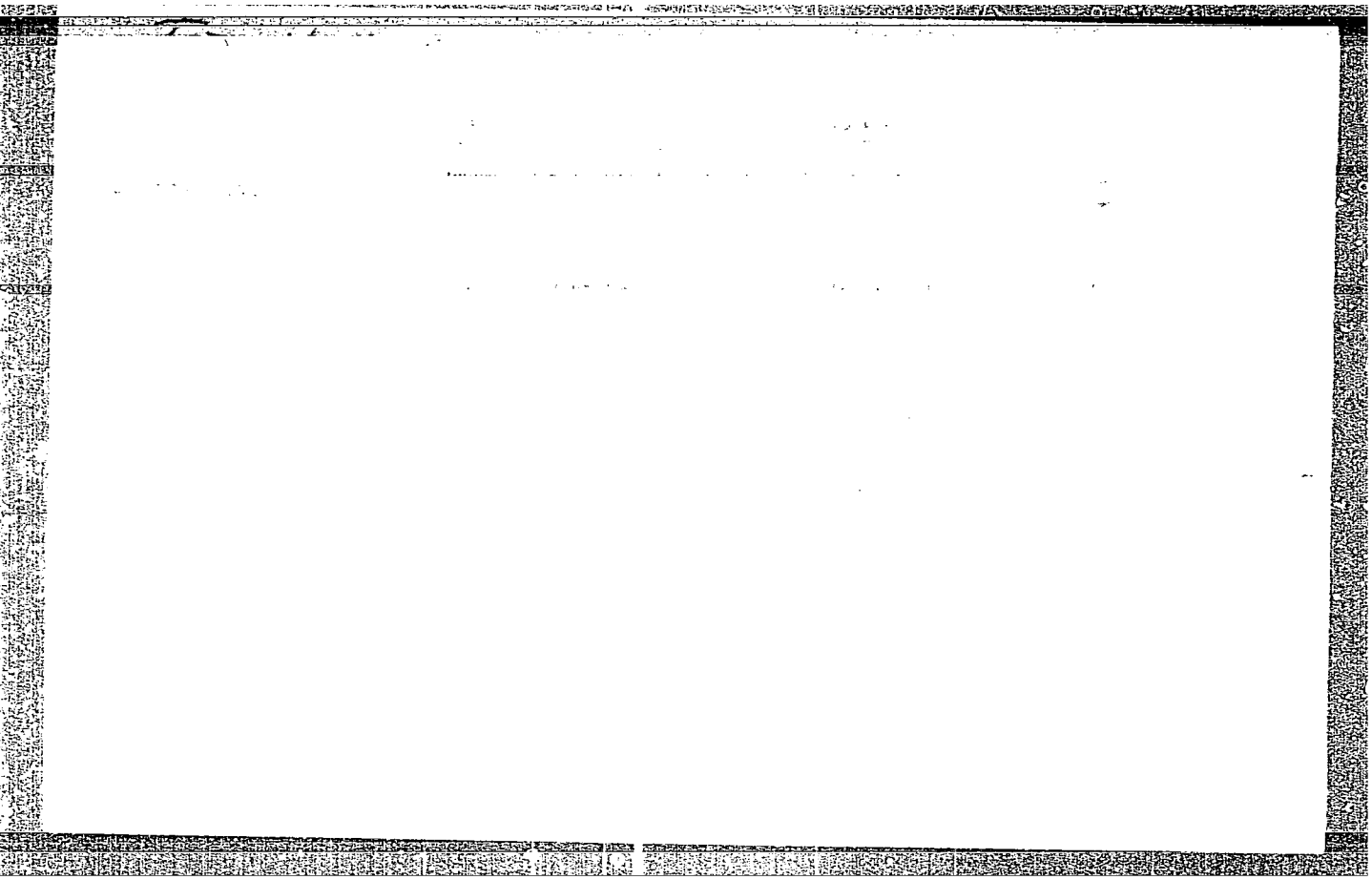
TOMILIN, B.A.

Cap fungi of some plant communities in the "Denezhkin Kamen'" (Central Urals). Bot. zhur. 50 no.4:546-551 Ap '65. (MIRA 18:5)

1. Botanicheskiy institut imeni Komarova AN SSSR, Leningrad.

TOMILOV, B.D.

Analysis of the variations in the consumption of materials as related to production costs. Trudy LIEI no.8:107-113 '54. (MLRA 9:9)
(Cost accounting)



APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R001756220006-2"

PORTNOV, M.A.; TOMILOV, B.I.

A potentiometric method for the determination of 3-nitro-toluene in 2-nitro-toluene [with summary in English]. Zhur.anal.khim. 12 no.3:402-405 My-Je '57. (MLRA 10:7)

1. Nauchno-issledovatel'skiy institut organicheskikh poluproduktov i krasiteley im. K.Ye. Voroshilova, filial v g. Rubezhnoye.
(Potentiometer analysis) (Toluene)

TOMILOV, B.I.

Electrochemical oxidation of chromium sulfate. Zhur.prikl.khim. 30 no.12:1785-1790 D '57. (MIRA 11:1)

1.Nauchno-issledovatel'skiy institut organicheskikh poluproduktov i krasiteley (filial v g. Rubezhnoye).
(Chromium sulfates) (Oxidation, Electrolytic)

S/076/60/034/008/022/039/XX
B015/B063

AUTHORS: Loshkarev, M. A. and Tomilov, B. I.

TITLE: Study of the Kinetics of Electrochemical Redox Reactions. I. Character of Polarization in the Benzoquinone-Hydroquinone System

PERIODICAL: Zhurnal fizicheskoy khimii, 1960, Vol. 34, No. 8, pp. 1753 - 1762

TEXT: In spite of the great number of studies conducted so far on polarization in redox systems, research workers disagree on the nature of polarization in these systems. The authors have studied the polarization of cathodic and anodic processes in the benzoquinone-hydroquinone system with a smooth platinum electrode, a platinized Pt electrode, and a gold electrode as a function of the intermixing rate of the electrolyte, the concentration of quinone or hydroquinone (in equimolar ratios), and temperature. Measurements were made in nitrogen under equal hydrodynamic conditions. The authors used the direct compensation method and a ППТВ (PPTV) potentiometer. The polarization curves were drawn by a method

proposed by S. V. Gorbachev and Khr. Iv. Noninski (Ref. 11), in which first the anode polarization $\Delta\varphi_a$ and then the cathode polarization $\Delta\varphi_k$ were measured at the same current density i. All the measurements were made in a 0.1 N HCl solution. The $i = f(\Delta\varphi_k)$ curves show that polarization is largely dependent upon the electrode material. A change in the concentration of quinhydrone ($c_{Q \cdot H_2Q}$) shows that the values of the anode limiting current I_a and the cathode limiting current I_k are proportional to $c_{Q \cdot H_2Q}$ and, on an average, $I_k : I_a = 1.13$. The values obtained are in agreement with the theory of V. G. Levich (Ref. 13), since the ratio between the diffusion coefficients of Q and H_2Q amounting to 2:3 corresponds to the ratio obtained for the limiting currents. A comparison between calculation and experiment shows that in the quinhydrone electrolysis there also takes place a noticeable chemical polarization which can be explained by an activation inhibition of electron transfer.

Study of the Kinetics of Electrochemical Redox Reactions. I. Character of Polarization in the Benzoquinone-Hydroquinone System

S/076/60/034/008/022/039/XX
B015/B063

The inclinations of the straight lines of the kinetic coefficients for the cathode (α) and the anode (β) processes on the smooth Pt electrode were found to be 0.44 and 0.48, and 0.36 and 0.48, respectively. The reason why $\alpha + \beta < 1$ will be discussed in a later article. There is no direct proportionality between the exchange current and the concentration of quinhydrone. The exchange current rises with temperature (about twice with a temperature rise of 10°C). The data obtained show that Vetter's assumption of two different exchange currents for the cathode and anode processes in the quinone-hydroquinone system (Z.Elektrochem., 56, 797, 1952) is incorrect and can be explained by impurities in the components. Special experiments conducted by the authors to clarify the rise of polarization with time and the decrease of the exchange current revealed that these changes are to be explained by impurities - decomposition products of quinone and hydroquinone - in the solution. The effect of adsorption upon polarization was studied by adding pyrogallol oxidation products and a cationic high-molecular compound. Also a change of α and β was found to occur besides a decrease of the exchange current. The inhibition of electrochemical processes by molecular adsorption on the electrode is

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Study of the Kinetics of Electrochemical Redox Reactions. I. Character of Polarization in the Benzoquinone-Hydroquinone System

S/076/60/034/008/022/039/XX
B015/B063

explained within the framework of A. N. Frumkin's theory of delayed discharge (Ref.14). The results of measurement are in good agreement with the equations of the theory of delayed discharge in the whole range of current density considered (from 10^{-6} a/cm^2 to $1 \cdot 10^{-3} - 5 \cdot 10^{-3}$ a/cm^2). O. A. Yesin, M. A. Loshkarev, and O. B. Khachaturyan are mentioned. There are 7 figures, 3 tables, and 14 references: 8 Soviet, 1 British, 1 US, 2 German, and 2 French.

ASSOCIATION: Khimiko-tekhnologicheskiy institut (Institute of Chemistry and Technology)

SUBMITTED: November 15, 1958

Card 4/4

TOMILOV, B.I.; LOSHKAREV, M.A.

Kinetics of electrochemical oxido-reduction reactions. Part 3.
Zhur. fiz. khim. 36 no.9:1902-1908 S '62. (MIRA 17:6)

1. Khimiko-tekhnologicheskiy institut, Dnepropetrovsk.

LOSHKAREV, M.A. (Dnepropetrovsk); TOMILOV, B.I. (Dnepropetrovsk)

Kinetics of electrochemical redox reactions. Part 2. Zhur. fiz. khim. 36 no.1:132-142 Ja '62. (MIRA 16:8)

(Quinones) (Hydroquinone)
(Oxidation-reduction reaction)

TOMILOV, B.I.; LOSHKAREV, I.A.

Rigorous method of computing the activation energy of electrochemical reactions. Dokl. AN SSSR 151 no.4:894-897 Ag '63. (MIRA 16:8)

1. Predstavleno akademikom A.N.Frumkinym.
(Electrochemistry) (Chemical reaction, Rate of)

TOMILOV, B.I.; LOSHKAREV, M.A.

Two setups for studying the kinetics of electrode processes on the basis of the ENO-1 electronic low-frequency oscillograph. Zhur. fiz. khim. 36 no.4:900-906 Ap '62. (MIRA 15:6)

1. Dnepropetrovskiy khimiko-tekhnologicheskiy institut.
(Oscillography) (Electrochemistry)

TOMILOV, G.D., inzh.

Faulty operation of the PZ-153 protection system due to the burning-out of the protectors. Elek. stat. 35 no.1:89-90 Ja '64. (MIRA 17:6)

TOMILOV, G.F.

Petroleum industry in the years of the Great Patriotic War (for the 20th anniversary of the victory over fascist Germany). Neft. khoz. 43 no.5:1-5 My '65. (MIRA 18:6)

PREOBRAZHENSKIY, V.S.; FADEYEVA, N.V.; MUKHINA, L.I.; TOMILOV, G.M.; MURZAYEV, E.M., doktor geograf.nauk, otv.red.; TUGARINOV, D.N., red.izd-va; MARKOVICH, S.G., tekhn.red.

[Types of landscape and natural zones of the Buryat A.S.S.R.] Tipy mestnosti i prirodnoe raionirovanie Buriatskoi ASSR. Moskva, Izd-vo Akad.nauk SSSR, 1959. 215 p. (MIRA 12:6)

1. Sotrudniki Instituta geografii Akademii nauk SSSR (for Preobrazhenskiy, Fadeyeva, Mukhina, Tomilov).
(Buryat-Mongolia--Physical geography)

TOMILOV, G.M.

Physicogeographical regions of the Eastern Sayans (within the Buryat A.S.S.R.). Krat. soob. BKNII no.1:25-33 '59. (MIRA 14:9)
(Sayan Mountains--Physical geography)

TOMILOV, G.M.

Surface silage of feeds. Zhivotnovodstvo 23 no.7:46-50 Jl '61. (MIRA 16:2)

1. Glavnyy agronom Novo-Sanzharovskogo sovkhoza, Omskoy oblasti.

(Corn (Maize))
(Ensilage)

NOSKOVA, N.I.; SADOVSKIY, V.D.; SOKOLOV, B.K.; TOMILOV, G.S.

Control of strain hardened steel articles by coercive force measurements. Zav.lab. 29 no.7:819-821 '63. (MIRA 16:8)

1. Institut fiziki metallov AN SSSR.
(Steel--Testing)

TOMILOV, G.S.; MATVEYEV, V.I.

Magnetic properties, conductivity and hardness of the M75 rail steel after isothermal quenching and subsequent tempering. Defektoskopiia no.1:72-81 '65. (MIRA 18:6)

1. Institut fiziki metallov AN SSSR.

ACC NR: AP7006051 SOURCE CODE: UR/0381/65/000/001/0086/0089

AUTHOR: Vasil'yeva, L. D.; Pomukhin, M. F.; Tomilov, G. S.; Utkina, V. A.

ORG: Institute of Metal Physics, AN SSSR (Institut fiziki metalov AN SSSR); Sverdlovsk Bearing Plant (Sverdlovskiy podshipnikovyy zavod)

TITLE: Some features of nondestructive magnetic quality control of quenched and tempered roller bearing made of ShKh15 and ShKh15SG steels

SOURCE: Defektoskopiya, no. 1, 1965, 86-89

TOPIC TAGS: quality control, roller bearing, tempering

ABSTRACT: The magnetic method for quality control of hardened roller bearing from measurements of two magnetic properties, magnetization and coercive force, has been successfully used at the GPZ-6 plant (State Bearing Plant No 6) since 1954.

The method is based on the fact that a knowledge of the parameter A_p, which is proportional to the coercive force H_c, makes possible rejection for underheating and low hardness, while a knowledge of the parameter A_s, which is related to the magnetization in a field of about 500 Oe, permits rejection for overheating (large amount of residual austenite, large acicular martensite).

The first and most reliable form of quality control of tempering is as follows: For each actual part, on the basis of the indications of the apparatus, a determination is made of A_s and A_p after quenching, and

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UDC: 620.179.14

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α_s and α_p after tempering. Then, from the differences $A_s - \alpha_s$ and $Ap - \alpha p$, it is possible to make a reliable judgement of the quality of tempering without resorting to additional comparisons with hardness. Many years of using the method has shown the following: 1) the rejection limits αmax_p and αmin_p, for each concrete type of part, are quite stable although they depend on the original structure and chemical composition of the steel. 2) In a number of comparatively rare cases, the "indefiniteness" of the limits αmax_p and αmin_p has been so large that it was completely impossible to sort out the parts according to values of α_p. In this case, the parts with HRC $\leqslant 59$, as a rule, had troostite in the structure. Such a wide uncertainty in the rejection limits with troostite present in the structure could be accounted for in this case either by poor quenching of the parts (rejection for "underheating" or for "low hardness"), or by large "fluctuations" of the original structure.

To make a comparison between the magnetic properties of well and poorly quenched parts after normal tempering, we quenched rollers made of ShKh15SG steel from different temperatures followed by tempering all the rollers at 150° for 4 hours. The magnetic properties were measured on a differential magnetic apparatus both after quenching (As, Ap), and after tempering (αs, αp). Not less then 10 rollers were quenched from each temperature.

ACC NR: AP7006051

Although, after quenching, the difference in coercive force of normally quenched parts and parts quenched with insufficient heating to troostite was large enought for confident rejection of the underheated parts, it nevertheless practically disappears after normal tempering, while the difference in structure and hardness remains. This result confirms the fact that in quality control of the heat treating bearing parts it is absolutely necessary to have separate quality control of quenching and tempering.

The lack of a reliable check on the quality of the original structure (after annealing) not only interfers with the technology of quenching, but at the same time introduces a large amount of confusion in magnetic quality control of quenching and subsequent tempering of parts. If 100% control of the original structure has not been carried out, it is necessary, in magnetic quality control of quenching, to take into account both the lower and upper limit αmax_p of the coercive force. Orig. art. has: 3 formulas and 2 tables. [JPRS]

SUB CODE: 13

Card 3/3

VASIL'YEVA, L.D.; POMYKHIN, M.F.; TOMILOV, S.S.; [illegible]

Some characteristics of nondestructive magnetic testing of the quality of temper hardening of antifriction bearing parts made of [illegible] ShKh15SG steels. Defektoskopiia no.1:86-89 [illegible].

(MIRA 17:6)

1. Institut fiziki metallov AN SSSR i Sverdlovskiy podshipnikovyy zavod.

VDOVIN, Yu.A.; VLASOV, V.V.; ZATSEPIN, N.N.; KOROBEYNIKOVA, I.Ye.; MIKHEYEV, M.N.; RODIGIN, N.M.; TOMILOV, G.S.; SHTURKIN, D.A.; YANUS, R.I.

Discussion on nondestructive testing methods. Defektoskopiia no.1:90-165. (MIRA 18:6)

34322
S/032/62/028/003/009/017
B101/B138

18.8100

AUTHORS: Mikheyev, M. N., and Tomilov, G. S.

TITLE: Possibility of controlling the heat treatment of tool steels by their magnetic properties and electrical resistivity

PERIODICAL: Zavodskaya laboratoriya, v. 28, no. 3, 1962, 307 - 310

TEXT: The authors report on measurements of the magnetic properties and electrical resistivity of the following steels:

Steel	% C	% Cr	% Mn	% Si	
ХВ5 (KhV5)	1.42	0.951	0.23	0.25	0.25% Ni; 5.20% W
ХГ3 (KhG3)	0.90	1.35	2.43	0.50	<0.03% P; <0.02% S
9ХС (9KhS)	0.90	0.95	0.50	1.20	- 0.018% S
У10А (U10A)	0.95-1.04	<0.15	0.15-0.30	0.15-0.30	
Х12 (Kh12)	2.15	11.50	<0.35	<0.40	
Х12Ф1 (Kh12F1)	1.44	11.60	0.23	0.34	0.23% Ni; 0.86% V; 0.018% P; 0.022% S

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Possibility of controlling...

KhG3 steel was produced from ШХ15СГ (ShKh15SG) steel by adding 1.5% Mn, at the laboratoriya pretsizionnykh splavov (Laboratory of Precision Alloys) of the authors' institute. The method of measuring had been published before (Fizika metallov i metallovedeniye, 8, 2, 176 (1959); ibid., 10, 5, 681 (1960); ibid., 8, 4, 543 (1959)). The data (Figs. 1 - 4) are interpreted. In KhG3 steel, the gradual decrease in resistivity with rising tempering temperature is evidence of the high stability of a manganous martensite. In KhV5, KhG3, and 9KhS, the coercive force first falls due to martensite disintegration, and then rises as the retained austenite disintegrates. If the latter process is completed martensite disintegration predominates (U10, KhV5), the coercive force shows a minimum at 300 - 400°C. If the retained austenite is not completely disintegrated, and martensite disintegration is delayed, coercive force is high (KhG3, 9KhS). This relationship between hardness and coercive force in martensitic steels can be used for quality control of these steels. In austenitic steels (Kh12, Kh12F1), the change in coercive force is not clearly established. The quality of these steels can be controlled by measuring resistivity or intensity of magnetization. There are 4 figures, 1 table, and 2 Soviet references.

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ASSOCIATION: Institut fiziki metallov Akademii nauk SSSR (Institute of Physics of Metals of the Academy of Sciences USSR)

Fig. 1. Magnetic properties, hardness, and electrical resistivity of KhV5 steel (a), and KhG3 steel (б) after hardening and tempering at various temperatures.

Legend: (a) • hardening from 1200°C; o hardening from 900°C; (б) • hardening from 810°C; , hardening from 1080°C; --- after treatment at -196°C and subsequent tempering; (1) oersteds; (2) gauss; (3) ohm·cm; abscissa: tempering temperature.

Fig. 2. Magnetic properties and electrical resistivity of 9KhS steel (a) and U10A steel (б) after hardening and tempering at various temperatures.

Legend: (a) o hardening from 850°C; • hardening from 1000 and 1140°C; (б) o hardening from 850°C; • hardening from 1200°C; (1) oersteds; (2) gauss; (3) ohm·cm; abscissa: tempering temperature.

TOMILOV, G. S.

Cand Tec Sci, Diss -- "On the connection of magnetic properties and electrical resistance with the microstructure, hardness and impact strength of construction and tool steels after various types of heat treatment". Sverdlovsk, 1961. 17 pp, 20 cm (Ural Branch of the Acad Sci USSR), 150 copies, Not for sale, 10 ref in bibl at end of text (KL, No 9, 1961, p 184, No 24371). [61-54854]

MIKHEYEV, M. N., KUZNETSOV, I. A., TOMILOV, G. S., AND FILIPPOV, S. D.

Magnetic Control of the Depth of the Hardened Layer and of the Hardness of Steel Tools Hardened by High-Frequency Currents

A mobile coercivity meter of M. N. Mikheyev's design for magnetic control of the depth of the hardened layer, treated by high frequency currents, is described. Experiments proved that the depth of the hardened layer, its hardness as well as that of the core are in constant ratio with the reading of the coercivity meter. (RZhFiz, No. 8, 1955)
Tr. in-ta Fiziki Metallov Uralsk Fil. AN SSSR, No. 14, 1954, 43-47.

SO: Sum. No. 744, 8 Dec 55 - Supplementary Survey of Soviet Scientific Abstracts (17)

MIKHEYEV, M. N., ZHUKOVA, P. N., AND TOMILOV, G. S.

Magnetic and Electric Properties of Alloyed Steels After Various Thermal Treatment

Coercive force, maxium magnetic permeability, saturation of magnetization, specific electric resistance, and hardness depending on thermal treatment of various steel alloys were studied for establishing best qualities of ready products. The causes of defects of steels 30 XGS, 41-34, 5 XBC, 40 CX were established. (RZhFiz, No. 8, 1955)
Tr. in-ta Fiziki Metallov Uralsk. Fil AN SSSR, No. 15, 1954, 90-102

SO: Sum. No. 744, 8 Dec 55 - Supplementary Survey of Soviet Scientific Abstracts (17)

MIKHEYEV, M.N.; MOROZOVA, V.M.; TOMILOV, G.S.; TITOROV, B.D.; BOCHENKOV, V.S.

Magnetic control of the depth of the case-hardened layer of cold rolls. Zav.lab. 22 no.1:52-56 '56. (MLRA 9:5)

1. Ural'skiy filial Akademii nauk SSSR i Ural'skiy zavod tyazhelogo mashinostroyenia imeni S. Ordzhonikidze.
(Steel--Testing) (Magnetic testing)

66222

18.8100 SOV/126-8-3-5/33

AUTHORS: Mikheyev, M.N. and Tomilov, G.S.

TITLE: A Contribution to the Problem Regarding the Anomalous Behaviour of the Coercive Force in Quenched and High Temperature-Tempered Steels

PERIODICAL: Fizika metallov i metallovedeniye, 1959, Vol 8, Nr 3, pp 346-348 (USSR)

ABSTRACT: The present paper endeavours to explain the anomalous behaviour of the coercive force of high temperature-tempered martensitic steels on the basis of the theory developed by Kondorskiy (Ref 4). The results of measurements of the magnetic properties of many structural and high carbon tool steels, as well as the temperature dependence of the magnetic properties, agree well with data of this theory. Fig 2 of the paper by Tomilov et alii (Ref 13) gives the magnetic properties, hardness and electrical resistance at room temperature of the typical structural steel 40KhN in relation to tempering temperature. The temperature dependence of the magnetic properties is shown in Fig 4 of the above paper, from which it can be seen that at an observation temperature of more than 220°C, when all carbides are

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A Contribution to the Problem Regarding the Anomalous Behaviour of the Coercive Force in Quenched and High Temperature-Tempered Steels

practically paramagnetic, a maximum for the coercive force can be observed in specimens which have been tempered at approximately 320°C. In specimens which have been tempered at all temperatures above 400°C, the coercive force falls steadily and practically rectilinearly with increase in tempering temperature. The magnetization to saturation of the matrix I_m, which can be observed at 300°C, remains practically constant in the whole tempering range of 400 to 650°C (curve 6 in Fig 4 of Ref 13). However, the magnetization to saturation at room temperature (curve 1) drops sharply in the above tempering temperature range. As the quantity of the carbide phase remains practically unaltered on tempering at above 400°C, its magnetism must decrease. From a consideration of these results and Kondorskiy's theory the authors confirm the correctness of the theory, which states that the anomalous behaviour of the coercive force of quenched and high temperature-tempered steels is associated with the change in shape, magnetization to saturation and average size of the carbides. There are

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SOV/126-8-3-5/33

A Contribution to the Problem Regarding the Anomalous Behaviour of the Coercive Force in Quenched and High Temperature-Tempered Steels

13 references, 3 of which are English, 1 German and 9 Soviet.

ASSOCIATION: Institut fiziki metallov AN SSSR (Institute of Metal Physics, AS USSR)

SUBMITTED: January 3, 1959

Card 3/3

S/126/60/010/005/008/030
E073/E535

AUTHOR: Tomilov, G. S.

TITLE: Magnetic and Electric Properties of Some Constructional Steels Associated with their Structure and their Proneness to Temper Brittleness

PERIODICAL: Fizika metallov i metallovedeniye, 1960, Vol.10, No.5, pp.681-690

TEXT: The magnetic properties (H_c, I_s, I_H = 1000, μ), the electric resistance and the mechanical properties (H_{R_c}, a_k) of steels tempered within a wide temperature range (150-700°C) and preliminarily quenched from 850 and 1200°C were measured. This enabled comparing the properties of normally quenched (fine grain) steels with those of strongly over-heated (coarse grain) steels. Furthermore, the temperature dependence of the magnetic properties ($H_c(t)$, $I_s(t)$) between -196 and +300°C was studied and the correlation between the magnetic, electric and mechanical properties in the tough and brittle states were systematically investigated. In the experiments three steels were used, of which

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Magnetic and Electric Properties of Some Constructional Steels Associated with their Structure and their Proneness to Temper Brittleness

the first (see table, composition in wt.%) was insensitive to reversible temper brittleness, whilst the other two were prone to temper brittleness.

Steel	C	Cr	Mn	Si	Mo	V	Ni	P	S
Ст.45 (St.45)	0.4-0.5	<0.30	0.5-0.8	0.17-0.37	-	-	-	<0.05	<0.05
45ХНМФА (45KhNMFA)	0.46	0.92	0.60	0.34	0.24	0.12	1.70	<0.02	<0.019
30ХГС (30KhGS)	0.27	0.98	0.90	1.18	-	-	-	-	-

The following conclusions are arrived at:
1) Investigation of the magnetic properties, the electric resistance and the mechanical properties (H_{R_c}, a_k) of normally quenched specimens

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E073/E535

Magnetic and Electric Properties of Some Constructional Steels Associated with their Structure and their Proneness to Temper Brittleness

(850°C) and specimens that have been strongly over-heated during quenching (1200°C) and tempering at various temperatures between 150 and 700°C, has shown that the coercive force of fine grain specimens in the tempering range up to 450°C is higher than the coercive force of coarse grain specimens. In the range of high temperature tempering (above 450°C), the coercive force of the carbon steel 45 is practically the same, irrespective of whether the specimens are coarse or fine grained. In the case of incomplete quenching (from 850°C), the coercive force of alloy steels in the range of high temperature tempering will be considerably lower for fine grain specimens than for coarse grain ones. The maximum coercive force in the range of the tempering temperatures 500 to 600°C will be the higher the higher the temperature of the previous quenching, i.e. the greater the quantity of carbon that is transferred into the solid solution as a result of quenching and the less residual carbides remain.

2) The assumption is expressed that the maximum coercive force in

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the range of high temperature tempering of steel hardened to martensite is associated with the carbide transformations $\varepsilon, \chi \rightarrow (Fe,Me)_3C$ and the particular magnetic properties of ε and χ carbides and of the cementite. In order that a maximum appears, a certain minimum carbon content transformed into the solid solution during the quenching process (about 0.4%) is necessary. The maximum coercive force is also influenced by the intensity of the processes during the first and second stages of tempering, since the elimination of internal stresses in the martensite depends on processes of decomposition of the residual austenite and the martensite, and the coercive force at these stages of tempering is determined by the magnitude and the degree of dispersion of type II stresses in the martensite.

3) Investigation of the temperature dependence of the coercive force and of the saturation magnetization confirmed the above expressed view on the nature of the maximum coercive force. The nature of the temperature dependence of the coercive force of constructional steel

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Magnetic and Electric Properties of Some Constructional Steels Associated with their Structure and their Proneness to Temper Brittleness

differs appreciably in the temperature range of the average (250-500°C) and the high temperature (above 500°C) tempering. This leads to an elimination of the equivocal character of the change in the coercive force within a wide range of tempering temperatures (400 to 700°C) if the measurements are carried out at sufficiently high temperatures (above 250°C). On the basis of coercive force measurements, quality control of high temperature tempering of steel components can be realised above 250°C.
4) Special investigations of the magnetic and electric properties and of the hardness of tough and brittle specimens during study of the phenomena of reversible temper brittleness have shown that there is no reliable correlation between these properties and the impact strength within a sufficiently wide temperature range of investigation of the magnetic properties, in the same way as was shown in earlier investigations of the magnetic and other physical properties at room temperature. There are 8 figures, 1 table and 11 references:

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S/126/60/010/005/008/030
E073/E535

Magnetic and Electric Properties of Some Constructional Steels Associated with their Structure and their Proneness to Temper Brittleness

10 Soviet and 1 French.

ASSOCIATION: Institut fiziki metallov AN SSSR
(Institute of Physics of Metals, AS USSR)

SUBMITTED: August 4, 1959 (Initially)
July 15, 1960 (After revision)

Card 6/6

TOMILOV, G.S.

Magnetic and electric properties of certain structural steels in connection with their structure and tendency toward temper brittleness. Fiz. met. i metalloved. 10 no.5:681-690 N '60.
(MIRA 14:1)

1. Institut fiziki metallov AN SSSR.
(Steel, Structural--Testing)

MIKHEYEV, M.N.; SURIN, G.V.; TOMILOV, G.S.

Differential magnetic instrument for the quality control of heat treatment. Zav.lab. 26 no.11:1306-1308 '60. (MIRA 13:11)

1. Institut fiziki metallov Akademii nauk SSSR.
(Magnetic testing)

MIKHEYEV, M.N.; TOMILOV, G.S.

Possibility of controlling the heat treatment of tool steels based on their magnetic properties and electric resistance. Zav.lab. 28 no.3:307-310 '62. (MIRA 15:4)

1. Institut fiziki metallov Akademii nauk SSSR.
(Steel--Heat treatment)

85534

S/032/60/026/011/027/035
B004/B067

18 8200

AUTHORS: Mikheyev, M. N., Surin, G. V., and Tomilov, G. S.

TITLE: Differential Magnetic Device for the Quality Control of Heat Treatment

PERIODICAL: Zavodskaya laboratoriya, 1960, Vol. 26, No. 11, pp.1306-1308

TEXT: A device for controlling the hardening of the components of ball and roll bearings is described (Fig. 1). Э denotes the standard, X the sample, Ф the ferroprobe designed by R. I. Yanus (Ref. 2), 1,8 the magnetizing coils, 2,3 the exciter coils, 4,5 the search coils, 6,7 the short-circuiting device. The difference of the coercive forces of sample and standard is indicated by a calibrated millivoltmeter via an amplifier. The device was successfully tested at the Sverdlovskiy podshipnikovyy zavod (Sverdlovsk Ball Bearings Factory) with ГПЗ-6 (GPZ-6) ball bearings. It may be used for controlling the heat treatment of products made of steels sensitive to overheating in hardening, for which the determination of the residual amount of austenite is important. There are 2 figures and 5 Soviet references.

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85534

Differential Magnetic Device for the Quality Control of Heat Treatment

S/032/60/026/011/027/035
B004/B067

ASSOCIATION: Institut fiziki metallov Akademii nauk SSSR
(Institute of Metal Physics of the Academy of Sciences USSR)

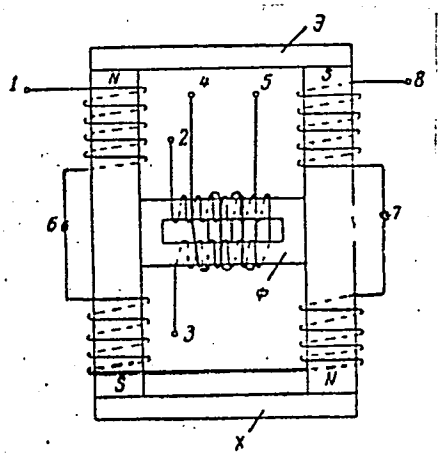

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Fig.
Рис. 1

SOV/32-25-4-28/71

25(6)

AUTHORS: Tomilov, G. S., Mikheyev, M. N., Pomukhin, M. F., Utkina, V. A.

TITLE: Magnetic Method for the Quality Control of the Thermal Treatment of Bearing Parts (Magnitnyy metod kontrolya kachestva termicheskoy obrabotki podshipnikovykh detaley)

PERIODICAL: Zavodskaya Laboratoriya, 1959, Vol 25, Nr 4, pp 448-453 (USSR)

ABSTRACT: The influence of the primary structure of bearing parts (made of steel ShKh 15) on the magnetic properties, the structure and hardness after hardening, was tested. Steel rolls (diameter = 23 mm, height = 20 mm) and samples with the dimensions 10 x 10 x 65 mm were used for the tests. By different preliminary treatment (Table) 4 groups of primary structures were obtained - from the heterogeneous coarse-grained perlite to the laminar perlite. The electric diagram of the device for determining the coercive force and for magnetizing ball and roller bearings (Fig 1), as well as the diagrams of the correlation between hardness and coercive force of the steel ShKh 15 in the primary state (Fig 2), and the coercive force after oil hardening at different temperatures (Fig 3) (for the two types of structure mentioned above), as well as a schematic representation (Fig 4) on the possibility of separating the good products from the

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Magnetic Method for the Quality Control of the Thermal Treatment of Bearing Parts

scrap after hardening, are given. In connection with the latter, a diagram of comparison between the coercive force and quality of residual austenite in the sample rolls, on one hand, and the microstructure and hardness after hardening, on the other, is shown (Fig 5). The test results show that even a 100% quality control of the hardening for hardness or coercive force approves a wide range of the primary structure "as good products". The most reliable quality control of hardening by the magnetic method can only be attained by a simultaneous determination of the saturation magnetization and the coercive force. The greatest effect of the continuous tests with magnetic differential devices for the quality control of hardening by the method of two magnetic characteristics can be expected by an automation of the process of thermal treatment and of the controlling method. The fact - not very important for industry - that at a hardening temperature above 950° and a prolonged hardening time a great increase in magnetization arises, is due to an impoverishment in carbon (Fig 6). The described method can also be applied to other types of steel, rich in carbon, the magnetic and mechanical properties of which vary with the hardening temperature and dis-

Magnetic Method for the Quality Control of the Thermal Treatment of Bearing Parts

persion of the primary structure, in analogy with the steel ShKh 15. There are 6 figures, 1 table, and 2 Soviet references.

ASSOCIATION: Institut fiziki metallov Akademii nauk SSSR i Sverdlovskiy podshipnikovyy zavod GPZ-6 (Institute of Metal Physics of the Academy of Sciences USSR, and Sverdlovsk Factory of Bearings GPZ-6)

18.1120
18.8100

67685
SOV/126-8-4-7/22

AUTHORS: Mikheyev, M.N., and Tomilov, G.S.

TITLE: Magnetic and Electrical Properties and Hardness of High-Carbon Alloyed Steels in the Hardened State

PERIODICAL: Fizika metallov i metallovedeniye, 1959, Vol 8, Nr 4, pp 543-556 (USSR)

ABSTRACT: The authors report an investigation of the magnetic properties after hardening of some industrial tool steels with the following percentage compositions:

KhV-5: 1.42 C, 0.51 Cr, 0.23 Mn, 0.25 Si, 5.2 W, 0.25 Ni;

KhG3 : 0.9o C, 1.35 Cr, 2.43 Mn, 0.50 Si, < 0.02 S, < 0.03 P;

ShKh15: 1.00 C, 1.50 Cr, 0.30 Mn, 0.30 Si, < 0.02 S, < 0.03 P;

ShKh15SG: 1.06 C, 1.45 Cr, 1.07 Mn, 0.50 Si, < 0.02 S, < 0.03 P;

Kh12F1: 1.44 C, 11.60 Cr, 0.28 Mn, 0.34 S, 0.23 Ni, 0.86 V, 0.022 S, 0.018 P.

The test steels were taken in the annealed state with a granular-pearlite structure tested after various heat

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Magnetic and Electrical Properties and Hardness of High-Carbon Alloyed Steels in the Hardened State

treatment. In addition to the magnetic properties the hardness and, sometimes, the electrical resistivity, were tested. The results are plotted against tempering temperature in Figs 1-6. Fig 7 shows the coercive force and quantity of residual austenite after hardening granular and lamellar pearlite of ShKh15SG steel from different temperatures in oil at room temperature. Microstructures were also studied. It was found that the course of the change of coercive force after hardening to micro-crystalline martensite reflects the degree of saturation of the solid solution by carbon and alloying elements and is therefore parallel to the course of the hardness and electrical-resistivity changes. This relation holds with increasing hardening temperature until the structure of the steel after hardening remains micro-crystalline. After complete solution of carbides overheating begins, with deterioration of mechanical properties and softening. In this stage the coercive force of martensite-class steels decreases, while that of austenite-class steels,

Magnetic and Electrical Properties and Hardness of High-Carbon Alloyed Steels in the Hardened State

containing little martensite after hardening, rises sharply. The behaviour of coercive force and magnetization in the hardening of specimens with very different initial structures points to a correlation between magnetic properties and grain size of steel, confirming the method previously proposed by the authors (with K.G. Rzyankin and V.A. Utkina) for checking the quality of hardening under production conditions (Ref 22). With hardening temperatures above 950 °C, even with heating in a periodically deoxidized fused barium-chloride bath, surface impoverishment occurs, giving a relatively hard surface while the saturation magnetization and coercive force increase with increasing hardening temperature; these effects do not arise if reaction between specimen and liquid is avoided or if the impoverishment layer is ground off.

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There are 7 figures, 3 tables and 22 references, of which 19 are Soviet, 1 is English, 1 is German and 1 in Acta Metallurgica.

67685

SOV/126-8-4-7/22

Magnetic and Electrical Properties and Hardness of High-Carbon Alloyed Steels in the Hardened State

ASSOCIATION: Institut fiziki metallov AN SSSR
(Institute of Physics of Metals, Ac. Sc. USSR)

SUBMITTED: February 3, 1959

Card 4/4

SOV/126-8-2-4/26

AUTHORS: Tomilov, G.S., Mikheyev, M.N. and Pomukhin, M.F.

TITLE: Magnetic Properties of Steels as a Basis for Magnetic Structural Analysis

PERIODICAL: Fizika metallov i metallovedeniye, 1959, Vol 8, Nr 2, pp 176 - 181 (USSR)

ABSTRACT: The principles of magnetic analysis for controlling structural changes during heat treatment of steels are well known. As troostite or pearlite are formed from martensite, there is a steady decrease in the coercive strength, as in hardness. However, tempering certain steels in the temperature range 200 - 600 °C results in a steady decrease in hardness but not in magnetic properties. Two steels were therefore investigated - ShKh15 (1.0% C, 1.5% Cr, 0.3% Mn and 0.3% Si) and 40KhN (0.4% C, 0.6% Cr, 0.6% Mn, 0.25% Si, 1.10% Ni). Figure 1 shows the changes in coercive strength (H_c), magnetic saturation (I_s), hardness (R_c) and electrical resistance (ρ) for ShKh15 with temperature. With

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Magnetic Properties of Steels as a Basis for Magnetic Structural Analysis

increase in tempering temperature R_c and ρ decrease steadily but H_c has a maximum at 500 - 525 °C. Similar curves are obtained for 40KhN (Figure 2). It is shown, however, that the observation temperature is important. If H_c is measured at a temperature greater than 220 (Curie temperature for carbides) there is a maximum H_c at a tempering temperature of about 400 °C and then a steady decrease. This confirms Kondorskiy's theory that the maximum H_c when measured at room temperature corresponding to a tempering temperature of 500 - 550 °C is caused by carbides. Thus, if measurements are carried out at 220 °C or slightly higher, good control

Magnetic Properties of Steels as a Basis for Magnetic Structural Analysis

of quality can be obtained for articles made from tempered martensite.
There are 4 figures, 1 table and 14 references, of which 13 are Soviet and 1 English.

ASSOCIATION: Institut fiziki metallov AN SSSR (Institute of Metal Physics of the Ac.Sc., USSR)

SUBMITTED: October 15, 1958

Card 3/3

MIKHEYEV, M.N.; TOMILOV, G.S.; POMUKHIN, M.F.; RZYANKIN, K.G.; UTKINA, V.A.

Magnetic control of the hardening and tempering of ball and roller bearing parts. Zav.lab. 22 no.5:549-555 '56. (MLRA 9:8)

1. Ural'skiy filial Akademii nauk SSSR i Sverdlovskiy gosudarstvennyy podshipnikovyy zavod.
(Steel--Heat Treatment) (Magnetic instruments) (Bearings (Machinery))

MIKHEYEV,M.N.; ZHUKOVA,P.N.; TOMILOV,G.S.

Magnetic and electric properties of alloyed steels following various heat treatment. Trudy Inst. fiz. met. no.15:90-102 '55. (MLRA 8:6)
(Steel alloys--Magnetic properties)

IRKHIN, A.F., inzh.; TOMILOV, I.A., inzh.

New mechanical system for cleaning large pipes. Elek. sta. 34 no.5:82-83 My '63. (MIRA 16:7)

(Pipe—Cleaning)

TOMILOV, I.I.

Late results of fenestration of the labyrinth in otosclerosis. Zhur. ush., nos. i gorl. bol. 20 no.6:54-59 N-D '60. (MIRA 15:2)

1. Iz kliniki bolezney ukha, gorla i nosa (zav. - zasluzhennyy deyatel' nauki prof. K.L.Khilov) Voyenno-meditsinskoy ordena Lenina akademii imeni S.M.Kirova.
(LABYRINTH (EAR)--SURGERY) (OTOSCLEROSIS)

TOMILOV, I.I.

Comparative evaluation of methods for acoumetry in the clinic and under experimental conditions. Zhur. ush., nos. i gorl. bol. 20 no.1:31-36 Ja-F '60. (MIRA 14:5)

1. Iz kliniki bolezney ukha, gorla i nosa (nachal'nik - zasluzhennyy deyatel' nauki prof. K.L.Khilov) Voyenno-meditsinskoy ordena Lenina akademii imeni S.M.Kirova.

(HEARING)

TOMILOV, I.I.

Eosinophilic granuloma of the cranial bones. Vest.otorin. 21 no.3:83-84 My-Je '59. (MIRA 12:9)

1. Iz kliniki bolezney ukha, gorla i nosa (nach. - zasluzhennyy deyatel' nauki prof.K.L.Khilov) Voyenno-meditsinskoy akademii imeni S.M.Kirova.

(EOSINOPHILIC GRANULOMA, case reports
cranium (Rus))
(CRANIUM, dis.
eosinophilic granuloma (Rus))

39933
S/149/62/000/004/003/003
A006/A101

18 1255

AUTHORS: Zamyatnin, M. M., Tsukanov, V. A., Tomilov, M. Ye., Shutov, I. A.

TITLE: The effect of low temperatures upon the mechanical properties of alloys BT 3 (VT3), BT 5 (VT5), and grade 40 XC (40KhS) steel

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Tsvetnaya metallurgiya, no. 4, 1962, 152 - 156

TEXT: The mechanical properties of titanium alloys and improved alloyed steel were investigated by comparison tests at temperatures from +20 to -60°C, in order to reveal the possibility of replacing high-strength steels by titanium alloys. Smooth and notched specimens were subjected to static tensile and bending tests, skew and impact tests. It was found that the properties of VT5 and, in particular, VT3 titanium alloys approach those of 40 KhS steel at all the test temperatures. The proneness of titanium alloys to reduced ductility and plasticity at low temperatures is somewhat greater than for improved steel; it is lower in impact tests. The results obtained show that titanium alloy parts can be successfully used at temperatures down to -60°C. There are 4 figures and 2 tables.

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The effect of low temperatures upon the... S/149/62/000/004/003/003
A006/A101

ASSOCIATION: Leningradskiy tekhnologicheskiy institut kholodil'noy promyshlennosti (Leningrad Technological Institute of the Refrigeration Industry)
Severo-Zapadnyy zaochnyy politekhnicheskiy institut (North-West Correspondence Polytechnic Institute)

SUBMITTED: January 22, 1962

X

Card 2/2

ACCESSION NR: AP3002902 S/0148/63/000/006/0153/0155

AUTHOR: Zamyatnin, M. M.; Zholobov, V. V.; Tomilov, M. Ye; Shutov I. A.

TITLE: Effect of low temperature on mechanical properties of titanium and its alloys

SOURCE: IVUZ. Chernaya metallurgiya, no. 6, 1963, 153-155

TOPIC TAGS: titanium, titanium alloys, mechanical properties, subzero temperatures

ABSTRACT: Because of insufficiency of available data, an investigation was made of the mechanical properties of the VT1-1 and VT1-2 commercial-grade titanium and titanium alloys VT3-1(1.0—2.0% Mo, 1.50—2.50% Cr, 4.5—6.2% Al), VT5 (4—5.5% Al), OT4 (1.0—2.0% Mn, 2.0—3.5% Al) at temperatures ranging from 20 down to -196C. Results of the tests are shown in Table 1 of the Enclosure. Org. art. has: 2 tables.

ASS: Leningrad Technological Inst. of the Refraction Insdustry. All-Union Aluminum-Magnesium Inst.

Card 1/1

GREKOV, N.A., inzh.; ZAMYATNIN, M.M., kand. tekhn. nauk; ZIKEYEVA, T.F., inzh.; TOMILOV, M.Ye., inzh.; SHUTOV, I.A., inzh.

Effect of temperature on the mechanical properties of soft solders and copper compounds soldered by them. Vest. elektroprom. 34 no.7:59-63 Jl '63. (MIRA 16:8)

TOMILOV, P., Geroy Sotsialisticheskogo Truda, mashinist

Working for the people. Mast.ugl. no.4:8 '59. (MIRA 12:6)

1. Kombayn shakhty No.7-8 tresta Kopeyskugol'.
(Coal mines and mining)

TOMILOV, P., geroy Sotsialisticheskogo Truda.

Devoting more attention to improvements of miners' towns. Mast.ugl.3 no.5:24 My '54. (MLRA 7:6)

1. Mashinist kombayna shakhty No.7-8 kombinata Chelyabinskugol'. (Coal miners)

TOMILOV,P., geroy sotsialisticheskogo truda

Possible reductions in the cost price of coal. Mast.ugl.4 no.8: 5-6 Ag'55. (MLRA 8:10)

1. Mashinist kombayna shakhty no.7-8 kombinata Chelyabinskugol' (Chelyabinsk Basin--Coal mines and mining)

TOMILOV, P. A.

Nash opyt vysokoproizvoditel nogo ispol zoviniya vrubovoy mashiny (Our experiance in high-productional utilization of a coal cutter) (Metod dvukratnoy zapubki ugol nogo plasta)—— Moskva (Izd-vo "Provda") 1951.

13 p. illus., tables.

At head of title: Vsesoyuznoye Obshchestvo po rasprostraneniyu Politicheskikh i nauchnykh znaniy.

Lecture discusses the method of couble-cutting of coal layers. Author refers to his experience with the two-bar cutting machine "KMP-1" producing great results.

TOMILOV, P. A.

Our high productive utilization of cutting machines 1951

TN813.T58 DS

1. Coal-mining machinery.

21 Coal mines and mining - Russia.

TOMILOV, P. A.

Unsere Erfahrungen Beim Hochproduktiven Arbeiten Mit Einer Schrammaschine. Leipzig, Fachbuchverlag, 1953. 15 p. Illus., Tables.
Translation from the Russian, "Nash Opyt Vysokoproizvoditel'nogo ispol' Zovaniya Vrubovoy Mashiny", Moscow, 1951.

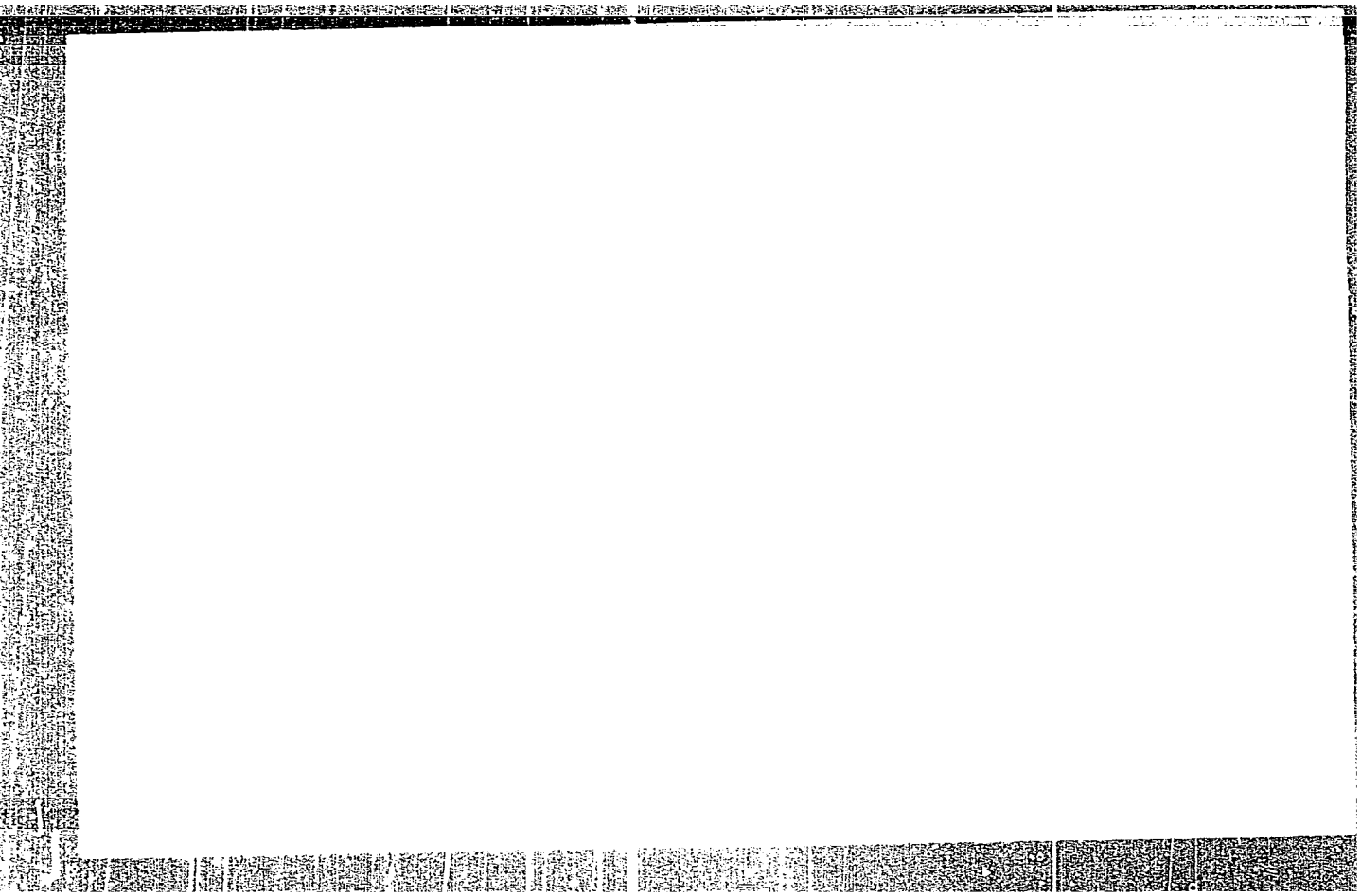
N/5
735.1
.T61

TOMILOV, S.B.

Preparation of a source from Co^{57} on chromium backing for studying the Mossbauer effect. Radiokhimiia 6 no.3:377 '64. (MIRA 18:3)

MURIN, A.N.; TOMILOV, S.B.; YUTLANDOV, I.A.

Separation and identification of products obtained in the spallation of germanium with high energy protons. Vest. LGU 19 no.4:105-110 '64. (MIRA 17:3)



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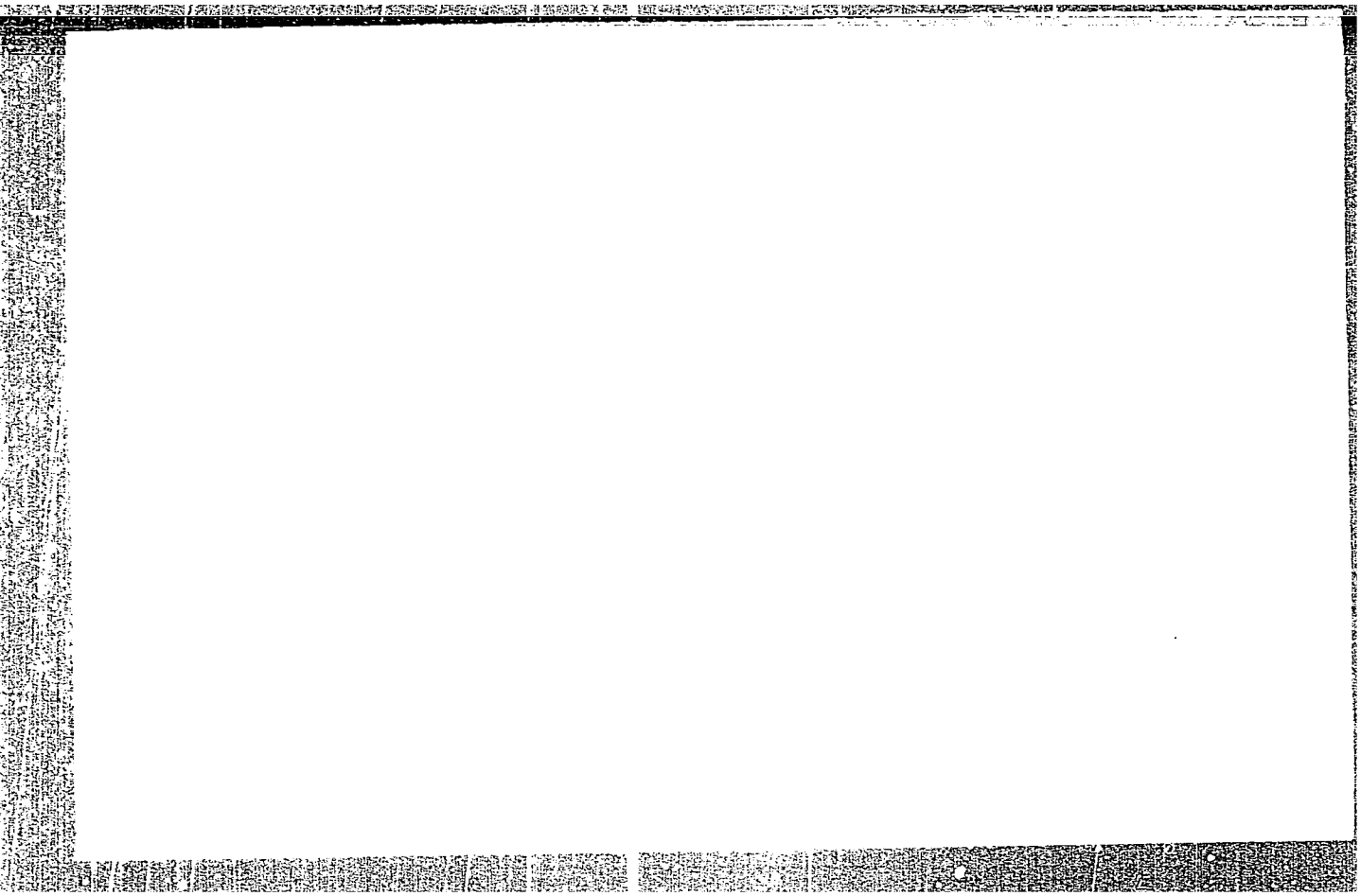

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L 00770-66 EWT(l)/EWP(e)/EWP(m)/EWP(i)/FCC/T/EWP(t)/EWP(b)/EWA(c) IJP(c)
JD/JG/JAJ/WH

ACCESSION NR: AP5012556 UR/0181/65/007/005/1447/1454

AUTHOR: Belyustin, A. A.; Ostanevich, Yu. M.; Pisarevskiy, A. M.; Tomilov, S. B.; Wu, Pai-shih; Cher, L.

TITLE: The Mossbauer effect in alkali-iron-silicate glasses

SOURCE: Fizika tverdogo tela, v. 7, no. 5, 1965, 1447-1454

TOPIC TAGS: Mossbauer effect, emission line, glass property, silicate glass, line splitting

ABSTRACT: The authors investigated the Mossbauer effect with the aid of apparatus with sinusoidal motion, described briefly elsewhere (ZhETF v. 46, 482, 1964). The source was Co^{57}, introduced by diffusion into metallic chromium. The width of the emission line was 0.35 mm/sec, and the position of the emission line practically coincided with the absorption line of stainless steel. The absorbers were powdered glass pressed together with small amounts of MgO. All the measurements were made at room temperature. Various compositions of glass were investigated. Values were obtained for the main parameters of the Mossbauer spectra (line width, chemical shift, quadrupole splitting). It is shown that the form of the Mossbauer spectra is governed by the main features of the structure and chemical composition of the glasses. The ratios of the different valence and structural states of iron in the

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ACCESSION NR: AP5012556

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glass are obtained as functions of the Fe_2O_3 concentration in the glass and of the amount and nature of the alkali iron. It is shown that the Mossbauer effect can be used to detect iron oxides colloidally dispersed in glass. "The authors thank A. N. Murin and Docent M. M. Shul'ts, who stimulated their interest in this topic, and also A. I. Sekirin, V. I. Khlus, L. A. Marshak, and G. V. Filomenko for help with the measurements." Orig. art. has: 7 figures, 7 formulas, and 2 tables.

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy (Joint Institute of Nuclear Research); Leningradskiy gosudarstvennyy universitet (Leningrad State University)

SUBMITTED: 07Dec64 ENCL: 00 SUB CODE: SS

NR REF SOV: 010 OTHER: 008

Card 2/2

L 9918-66 EWP(t)/EWT(l)/EWT(m)/T/EWP(b)/EWA(c) IJP(c) JD/JG

ACC NR: AP6000862 SOURCE CODE: UR/0181/65/007/012/3607/3611

AUTHOR: Belozerskiy, G. N.; Nemilov, Yu. A.; Tomilov, S. B.; Shvedchikov, A. V.

ORG: none

TITLE: Mossbauer effect in InP and GaAs

SOURCE: Fizika tverdogo tela, v. 7, no. 12, 1965, 3607-3611

TOPIC TAGS: Mossbauer effect, gallium arsenide, indium compound, line width

ABSTRACT: This is a continuation of earlier work (FTT v. 7, 1264, 1965) where the Mossbauer effect was observed in indium antimonide. The present investigation was undertaken for the purpose of obtaining more data on semiconductors of the type $A^{III}B^{V}$. The InP investigated was polycrystalline and the GaAs was a single crystal cut perpendicular to the (111) axis. The sources were prepared by a standard technique and the spectrum was measured with apparatus described earlier (FTT v. 5, 3350, 1963). The Mossbauer effect was observed at room temperature and at temperature of liquid nitrogen. The chemical shift at room temperature was 0.3—0.37 mm/sec at a line width of 0.59 mm/sec. The probability of recoilless quantum emission was calculated. The absolute measurements were made with an InSb source and a stainless steel absorber, for which $f_{InSb} = 0.84 \pm 0.065$. For GaAs and InP the value of f was obtained by means of relative measurements at room temperature and found to be 0.84 ± 0.065 and 0.89 ± 0.07, respectively. The absorbers used were stainless steel foils of thickness 6.7, 7.1, 13.1, 14.2, 20.7, and 27.6 mg/cm^2. It is concluded from the

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ACC NR: AP6000862

obtained data that the iron in the GaAs and InP is in the form of a trivalent impurity, and that the large magnitude of the effect indicates that the optical branches in the impurity-atom vibrations play an important role. Orig. art. has: 1 figure, 5 formulas, and 1 table. [02]

SUB CODE: 20/ SUBM DATE: 24Apr65/ ORIG REF: 004/ OTH REF: 006

ATD PRESS: 4166

Card 2/2

L 23112-66 EWT(m)/EWP(t) LJP(c) JD
ACC NR: AP6006867 SOURCE CODE: UR/0181/66/008/002/0604/0606

AUTHOR: Belozerskiy, G. N.; Nemilov, Yu. A.; Tomilov, S. B.; Shvedchikov, A. V.

ORG: none

TITLE: Mossbauer effect in ZnS and Ge

SOURCE: Fizika tverdogo tela, v. 8, no. 2, 1966, 604-606

TOPIC TAGS: Mossbauer effect, germanium, zinc sulfide, iron, line shift, line width, impurity level, crystal lattice

ABSTRACT: The purpose of the investigation was to study the behavior of impurity atoms Fe^{57} in the diatomic crystal lattice of ZnS and to compare this behavior with that of the same atoms introduced in germanium, where the spectra are similar at room temperature. The sources were ZnS single crystals on which several drops of $Co^{57}Cl_2$ solution were placed and allowed to evaporate. The detector was a proportional counter filled with a mixture of argon and methane. The elimination of the background is briefly discussed. The values obtained for the chemical shift, the width, and the effect probability of ZnS at room temperature were $\delta = (0.76 \pm 0.02)$ mm/sec, $\Gamma = (0.710 \pm 0.025)$ mm/sec, and $f = 0.6$ to 0 ± 0.055. The results are compared with earlier measurements made on germanium with Co^{57} (FTT v. 7, 3617,

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1965). The results obtained for ZnS point to a strong change in the width of the Mossbauer spectrum when the source is cooled to 78K. This is attributed to the fact that the impurity atoms are situated at different levels, and that the difference between levels disappears with increasing temperature. To observe the temperature dependence of the effect, it is necessary to assume an effective temperature which is much higher than the Debye temperature. The authors thank K. A. Dubenskiy for supplying the ZnS and ZnSe samples. Orig. art. has: 2 figures, 1 formula, and 1 table.

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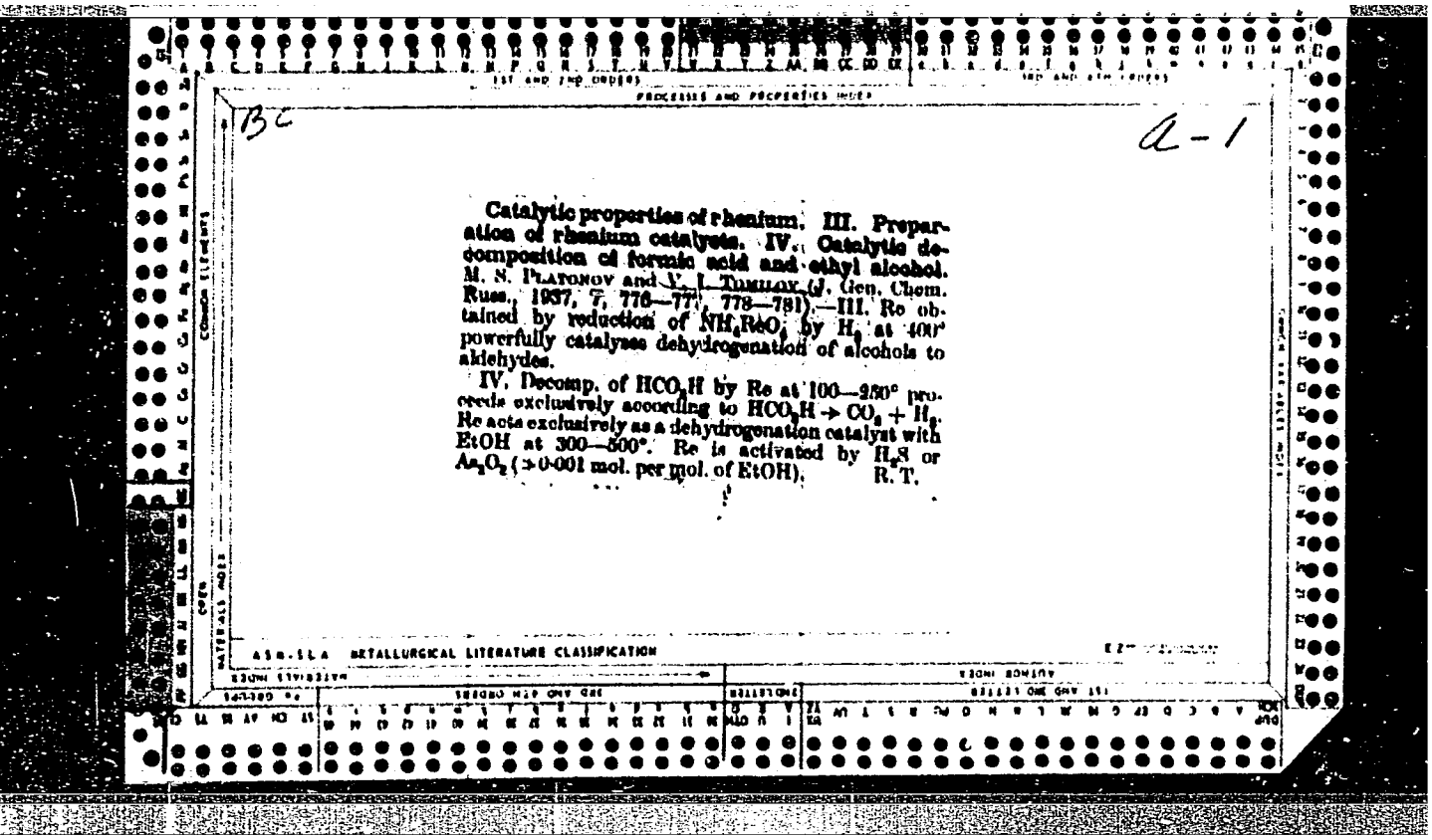

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Catalytic properties of rhenium. III. Preparation of rhenium catalysts. IV. Catalytic decomposition of formic acid and ethyl alcohol. M. S. Platonov and V. I. Tomilov (J. Gen. Chem. Russ., 1937, 7, 776—777, 778—781).—III. Re obtained by reduction of NH_4ReO_4 by H_2 at 400° powerfully catalyses dehydrogenation of alcohols to aldehydes.

IV. Decomp. of HCO_2H by Re at 100—250° proceeds exclusively according to $HCO_2H \rightarrow CO_2 + H_2$. Re acts exclusively as a dehydrogenation catalyst with EtOH at 300—500°. Re is activated by H_2S or As_2O_3 (> 0·001 mol. per mol. of EtOH). R. T.

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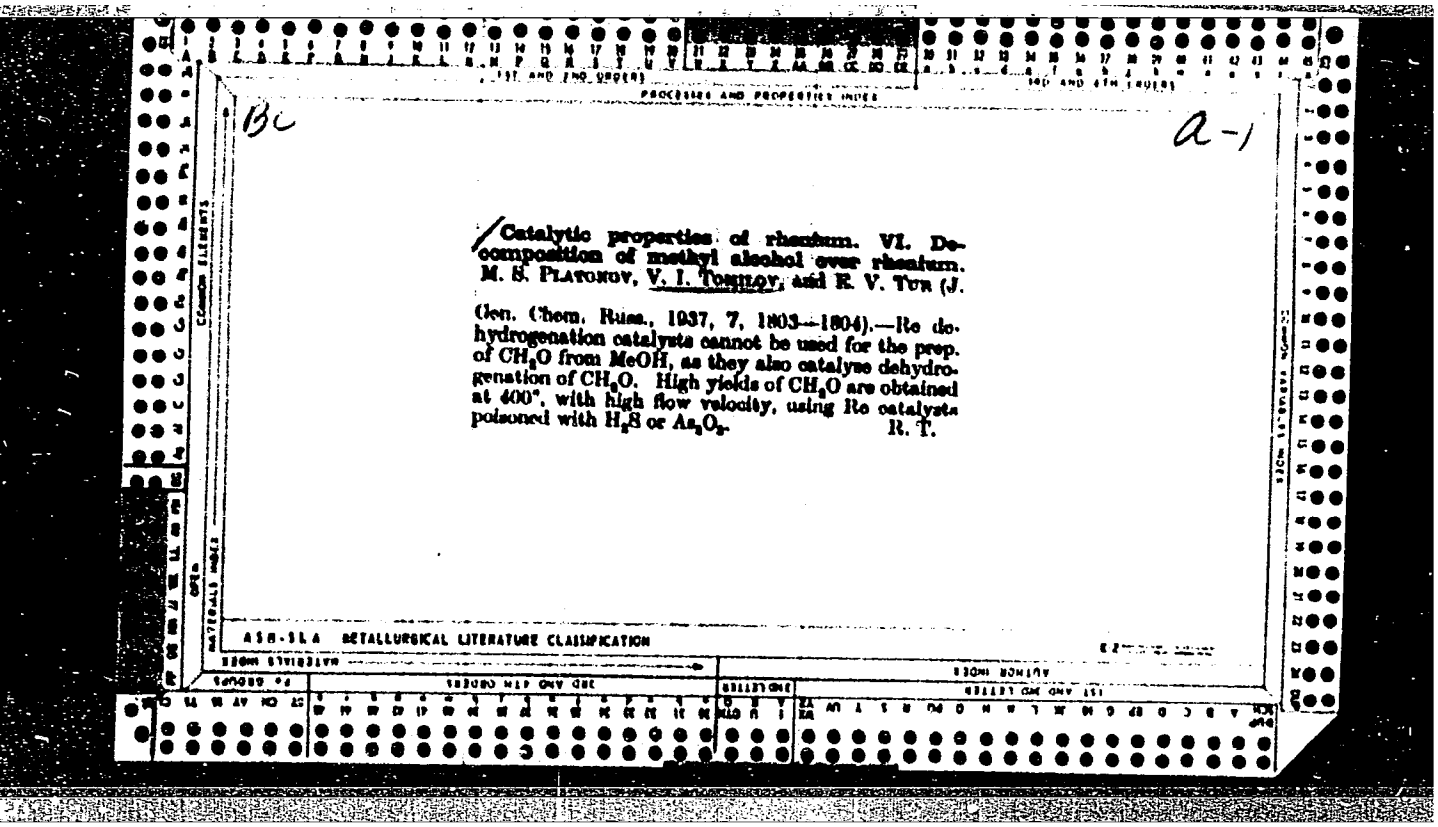

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Catalytic properties of rhenium. VI. Decomposition of methyl alcohol over rhenium. M. S. PLATONOV, V. I. TOMILOV, and R. V. TUR (J. Gen. Chem. Russ., 1937, 7, 1803—1804).—Re dehydrogenation catalysts cannot be used for the prep. of CH_2O from MeOH, as they also catalyse dehydrogenation of CH_2O. High yields of CH_2O are obtained at 400°, with high flow velocity, using Re catalysts poisoned with H_2S or As_2O_3. R. T.

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